



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2013-0328; Directorate Identifier 2012-NM-184-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to supersede an existing airworthiness directive (AD) that applies to certain The Boeing Company Model 747-400 and -400D series airplanes. The existing AD currently requires repetitive inspections to detect cracks in the floor panel attachment fastener holes of the Section 41 upper deck floor beam upper chords, and corrective actions if necessary; and repetitive post-repair and post-modification inspections, and corrective actions if necessary. Since we issued that AD, an evaluation by the design approval holder (DAH) indicated that certain upper chords of the upper deck floor beam are subject to widespread fatigue damage (WFD). A replacement was developed to support the airplane's limit of validity (LOV) of the engineering data that support the established structural maintenance program. This proposed AD would add repetitive inspections of Section 44 upper deck floor beam upper chords, and corrective actions if necessary; repetitive post-repair and post-modification inspections, and corrective actions if necessary; and replacing the upper deck floor beam upper chords. We are proposing this AD to detect and correct fatigue cracking in certain upper chords of the upper deck floor beam, which could become large and cause the floor beams to become severed and result in rapid decompression or reduced controllability of the airplane.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221.

### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Roger Caldwell, Aerospace Engineer, Technical Operations Center, ANM-100D, FAA, Denver Aircraft Certification Office (ACO), 26805 East 68th Avenue, Room 214, Denver, CO 80249; phone: 303-342-1086; fax: 303-342-1088; email: [roger.caldwell@faa.gov](mailto:roger.caldwell@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposed AD. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2013-0328; Directorate Identifier 2012-NM-184-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

**Discussion**

Structural fatigue damage is progressive. It begins as minute cracks, and those cracks grow under the action of repeated stresses. This can happen because of normal operational conditions and design attributes, or because of isolated situations or incidents such as material defects, poor fabrication quality, or corrosion pits, dings, or scratches. Fatigue damage can occur locally, in small areas or structural design details, or globally.

Global fatigue damage is general degradation of large areas of structure with similar structural details and stress levels. Multiple-site damage is global damage that occurs in a large structural element such as a single rivet line of a lap splice joining two large skin panels. Global damage can also occur in multiple elements such as adjacent frames or stringers. Multiple-site-damage and multiple-element-damage cracks are typically too small initially to be reliably detected with normal inspection methods. Without intervention, these cracks will grow, and eventually compromise the structural integrity of the airplane, in a condition known as widespread fatigue damage (WFD). As an airplane ages, WFD will likely occur, and will certainly occur if the airplane is operated long enough without any intervention.

The FAA's WFD final rule (75 FR 69746, November 15, 2010) became effective on January 14, 2011. The WFD rule requires certain actions to prevent structural failure due to WFD throughout the operational life of certain existing transport category airplanes and all of these airplanes that will be certificated in the future. For existing and future airplanes subject to the WFD rule, the rule requires that DAHs and applicants establish a LOV of the engineering data that support the structural maintenance program. Operators affected by the WFD rule may not fly an airplane beyond its LOV, unless an extended LOV is approved.

The WFD rule (75 FR 69746, November 15, 2010) does not require identifying and developing maintenance actions if the DAHs can show that such actions are not necessary to prevent WFD before the airplane reaches the LOV. Many LOVs, however, do depend on accomplishment of future maintenance actions. As stated in the WFD rule,

any maintenance actions necessary to reach the LOV will be mandated by airworthiness directives through separate rulemaking actions.

In the context of WFD, this action is necessary to enable DAHs to propose LOVs that allow operators the longest operational lives for their airplanes, and still ensure that WFD will not occur. This approach allows for an implementation strategy that provides flexibility to DAHs in determining the timing of service information development (with FAA approval), while providing operators with certainty regarding the LOV applicable to their airplanes.

On May 1, 2009, we issued AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009), for certain Boeing Model 747-400 and 747-400D series airplanes. That AD requires repetitive inspections to detect cracks in the floor panel attachment fastener holes of the Section 41 upper deck floor beam upper chords, and related investigative and corrective actions if necessary. That AD resulted from reports of cracks found in the Section 41 upper deck floor beam upper chords. We issued that AD to detect and correct cracks in these chords, which could become large and cause the floor beams to become severed and result in rapid decompression or reduced controllability of the airplane.

**Actions Since Existing AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009) Was Issued**

Since we issued AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009), an evaluation by the DAH indicating that certain upper chords of the upper deck floor beam are subject to WFD. The replacement was developed to support the airplane's LOV of the engineering data that support the established structural maintenance program.

### **Relevant Service Information**

We reviewed Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012. For information on the procedures and compliance times, see this service information at <http://www.regulations.gov> by searching for Docket No. FAA- 2013-0328.

### **FAA's Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

### **Proposed AD Requirements**

This proposed AD would retain all requirements of AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009). This proposed AD would add repetitive inspections of Section 44 upper deck floor beam upper chords, and corrective actions if necessary; repetitive post-repair and post-modification inspections, and corrective actions if necessary; and replacing the upper deck floor beam upper chords.

In addition, the phrase "corrective actions" might be used in this proposed AD. "Corrective actions" are actions that correct or address any condition found. Corrective actions in an AD could include, for example, repairs.

### **Changes to Existing Language in Paragraph (g) of this AD**

We have revised paragraph (g) of this AD to clarify the terminology and repetitive inspections. We have removed the term "related investigative actions" from the paragraph and added a sentence describing the repetitive inspections for airplanes on which a repair or modification has been done.

### **Differences Between the Proposed AD and the Service Information**

Where Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, specifies to contact Boeing for repair instructions, this AD requires

repairing using a method approved in accordance with the procedures specified in paragraph (p) of this AD.

### **Explanation of Compliance Time**

The compliance time for the replacement specified in this proposed AD for addressing WFD was established to ensure that discrepant structure is replaced before WFD develops in airplanes. Standard inspection techniques cannot be relied on to detect WFD before it becomes a hazard to flight. We will not grant any extensions of the compliance time to complete any AD-mandated service bulletin related to WFD unless extensive new data are provided.

### **Costs of Compliance**

We estimate that this proposed AD affects 84 airplanes of U.S. registry.

We estimate the following costs to comply with this proposed AD:

#### **Estimated costs**

| <b>Action</b>   | <b>Labor cost</b>  | <b>Parts cost</b> | <b>Cost per product</b>            | <b>Cost on U.S. operators</b>        |
|---|--|-------------------|------------------------------------|--------------------------------------|
| Inspection [retained actions from existing AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009)] | Up to 50 work-hours X \$85 per hour = Up to \$4,250 per inspection cycle | \$0               | Up to \$4,250 per inspection cycle | Up to \$357,000 per inspection cycle |
| Inspection [new proposed action]  | 259 work-hours X \$85 per hour = \$22,015 per inspection cycle           | \$0               | \$22,015 per inspection cycle      | \$1,849,260 per inspection cycle     |

We have received no definitive data that would enable us to provide a cost estimate for the repair or modification specified in this proposed AD.

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator.

Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

We have determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.



## **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by removing airworthiness directive (AD) 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009), and adding the following new AD:

**The Boeing Company:** Docket No. FAA- 2013-0328; Directorate Identifier 2012-NM-184-AD.

#### **(a) Comments Due Date**

The FAA must receive comments on this AD action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

This AD supersedes AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009).

#### **(c) Applicability**

This AD applies to The Boeing Company Model 747-400 and -400D series airplanes; certificated in any category; as identified in Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012.

#### **(d) Subject**

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 53, Fuselage.

**(e) Unsafe Condition**

This AD was prompted by an evaluation by the design approval holder (DAH) indicating that certain upper chords of the upper deck floor beam are subject to widespread fatigue damage (WFD). A replacement was developed to support the airplane's limit of validity (LOV) of the engineering data that support the established structural maintenance program. We are issuing this AD to detect and correct fatigue cracking in certain upper chords of the upper deck floor beam, which could become large and cause the floor beams to become severed and result in rapid decompression or reduced controllability of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Retained Inspections and Corrective Actions with Revised Service Information and Compliance Times**

This paragraph restates the actions required by paragraph (g) of AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009) with revised service information and compliance times. Except as required by paragraphs (h)(1) and (h)(2) of this AD: At the applicable times in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2688, dated August 21, 2008, do an inspection (open-hole or surface high frequency eddy current (HFEC)) to detect cracks in the floor panel attachment fastener holes of the Section 41 upper deck floor beam upper chords, and do applicable corrective actions, by accomplishing all the applicable actions specified in the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2688, dated August 21, 2008; or Revision 1, dated September 19, 2012. Repeat the inspections, including the post-modification and post-repair repetitive inspections, thereafter at the applicable times specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2688, dated August 21, 2008, except as required by paragraph (i) of this AD. As

of the effective date of this AD, use only Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, to accomplish the actions in this paragraph.

**(h) Retained Exceptions**

(1) This paragraph restates the exception stated in paragraph (h) of AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009). If any crack is found during any inspection required by paragraph (g) of this AD, and Boeing Alert Service Bulletin 747-53A2688, dated August 21, 2008; or Revision 1, dated September 19, 2012; specifies to contact Boeing for appropriate action: Before further flight, repair the crack using a method approved in accordance with the procedures specified in paragraph (p) of this AD.

(2) This paragraph restates the exception stated in paragraph (i) of AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009). Where Boeing Alert Service Bulletin 747-53A2688, dated August 21, 2008, specifies a compliance time after the date on the service bulletin, this AD requires compliance within the specified compliance time after June 17, 2009 (the effective date of AD 2009-10-06).

**(i) New Compliance Time for Airplanes on Which a Repair or Modification is Done**

For airplanes on which a repair or modification identified in Table 2 of 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, has been done: At the times specified in Table 2 of paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, except as required by paragraph (n)(3) of this AD, do open-hole and surface HFEC inspections, as applicable, for cracking, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012. Repeat at the applicable intervals specified in Table 2 of paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012. If any cracking is found in the repaired or

modified locations, before further flight, repair the crack using a method approved in accordance with the procedures specified in paragraph (p) of this AD.

**(j) New Inspections and Repair**

For Group 1 airplanes identified in Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012: At the applicable times specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, except as specified in paragraph (n)(2) of this AD: Do an open-hole or surface HFEC inspection to detect cracking in the floor panel attachment fastener holes of the Section 44 upper deck floor beam upper chords, and all applicable corrective actions, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, except as required by paragraph (n)(1) of this AD. Repeat the inspections thereafter at the applicable intervals specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012. Do all applicable corrective actions before further flight.

**(k) New Optional Terminating Modification**

Doing a hole modification or repair as a hole modification, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, terminates the repetitive inspections specified in paragraph (j) of this AD.

**(l) New Inspection and Repair of Repaired or Modified Locations**

(1) For airplanes on which a repair or modification specified in the “Condition” column of Table 4 of paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, has been done: At the times specified in Table 4 of paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, except as required by paragraph

(n)(3) of this AD, do open hole and surface HFEC inspections, as applicable, for cracking, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012. Repeat at the applicable intervals specified in Table 4 of paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012. If any cracking is found in the repaired or modified locations, before further flight, repair the crack using a method approved in accordance with the procedures specified in paragraph (p) of this AD.

**(m) New Replacement**

At the time specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012: Replace Section 41 and 44 upper deck floor beam upper chords, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012.

**(n) New Exceptions**

(1) If any crack is found during any inspection required by paragraph (i) of this AD, and Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, specifies to contact Boeing for appropriate action: Before further flight, repair the crack using a method approved in accordance with the procedures specified in paragraph (p) of this AD.

(2) Where Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, specifies a compliance time “after the Revision 1 date of this service bulletin,” this AD requires compliance within the specified compliance time after the effective date of this AD.

(3) Where Table 2 or Table 4 of paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 747-53A2688, Revision 1, dated September 19, 2012, specifies to contact Boeing for inspections and compliance times: Before further flight, contact the

FAA for inspections and compliance times, and accomplish the inspections at the given times.

**(o) New Credit for Previous Actions**

This paragraph provides credit for the actions required by paragraph (g) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 747-53A2688, dated August 21, 2008, which has not been incorporated by reference in this AD.

**(p) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (q)(2) of the Related Information section of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(4) AMOCs approved for AD 2009-10-06, Amendment 39-15901 (74 FR 22424, May 13, 2009) are approved as AMOCs for the corresponding actions of this AD.

**(q) Related Information**

(1) For more information about this AD, contact Roger Caldwell, Aerospace Engineer, Technical Operations Center, ANM-100D, FAA, Denver Aircraft Certification Office (ACO), 26805 East 68th Avenue, Room 214, Denver, CO 80249; phone: 303-342-1086; fax: 303-342-1088; email: [roger.caldwell@faa.gov](mailto:roger.caldwell@faa.gov).

(2) For information about AMOCs, contact Bill Ashforth, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle ACO, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6432; fax: 425-917-6590; email: [bill.ashforth@faa.gov](mailto:bill.ashforth@faa.gov).

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221.

Issued in Renton, Washington, on April 5, 2013.

Ali Bahrami,  
Manager,  
Transport Airplane Directorate,  
Aircraft Certification Service.

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